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SCHLUMBERGER-DOLL RESEARCH

ATTN: INTELLECTUAL PROPERTY LAW DEPARTMENT

P.O. BOX 425045

CAMBRIDGE, MA 02142

EXAMINER

HUGHES, SCOTT A

ART UNIT

PAPER NUMBER

3663

MAIL DATE

DELIVERY MODE

06/23/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/561,356

Applicant(s)

ARROWSMITH ET AL.

Examiner

SCOTT A. HUGHES

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2006.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-24 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 19 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date 7/24/2006
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 24 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 24 is claiming a computer program only, without reciting that the program is encoded on a computer readable medium. The claim further does not positively recite that the program in a process where a computer is executing the program (for controlling does not positively recite that the program is being used in the process, it instead only states what the program is for and not what the program is doing). Therefore, claim 24 is non-statutory subject matter. See MPEP 2106.01.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-8, 10-11, and 15-20 are rejected under 35 U.S.C. 102(a) as being anticipated by Brancato (ELSEVIER April 18, 2003).

With regard to claim 1, Brancato discloses a method of identifying passive seismic events in seismic data (abstract). Brancato discloses seismic data comprising

at least first seismic data traces acquired at a first seismic receiver (station) and second seismic data traces acquired at a second receiver (station) spatially separated from the first receiver (Fig. 2) (Page 223, 224). Brancato discloses determining an overall measure of similarity for a pair of passive seismic events in the seismic traces (determinations made for the set of stations are disclosed as being used), the overall measure of similarity being indicative of the similarity between the events acquired at the first seismic receiver, and of similarity between the events acquired at the second receiver (abstract; 222-224; 229-230, 232).

With regard to claim 2, Brancato discloses that the method involves a real time processing method (221, 1st column).

With regard to claim 3, Brancato discloses that the overall measure of similarity is an overall correlation coefficient indicative of correlation between events acquired at the first receiver and correlation between events from the second receiver (abstract; 222-224; 229-230, 232).

With regard to claim 4, Brancato discloses that determining the overall correlation coefficient comprises determining a first correlation coefficient from the pair of events from the first data, determining a second correlation coefficient for the pair of events from the second data, and determining the overall correlation coefficient for the pair of events from the first correlation coefficient and the second correlation coefficient (223-224, 229-230, 232).

With regard to claim 5, Brancato discloses comparing the overall measure of similarity for the pair of events with a first predetermined threshold (222-224; 229-230, 232).

With regard to claim 6, Brancato discloses identifying the pair of events as a doublet if the overall measure of similarity is equal to or greater than the first threshold (223-224, 229-230, 232).

With regard to claim 7, Brancato discloses that the first receiver is a multicomponent receiver (Fig. 2). Brancato discloses determining respective correlation coefficients for the pair of events for each data component acquired by the receiver, and determining the first correlation coefficient for the pair of events from the respective correlation coefficients (Fig. 2) (222-224, 229-232).

With regard to claim 8, Brancato discloses determining coefficients in the frequency domain (Fig. 2) (222-224, 229-232).

With regard to claim 10, Brancato discloses that the second receiver is a multicomponent receiver (Fig. 2). Brancato discloses determining respective correlation coefficients for the pair of events for each data component acquired by the receiver, and determining the second correlation coefficient for the pair of events from the respective correlation coefficients (Fig. 2) (222-224, 229-232).

With regard to claim 11, Brancato discloses determining coefficients in the frequency domain (Fig. 2) (222-224, 229-232).

With regard to claim 15, Brancato discloses acquiring first and second receiver data simultaneously, and processing the data according to claim 1 (Fig. 2) (abstract; 222-224; 229-230, 232).

With regard to claim 16, Brancato discloses an apparatus for identifying passive seismic events in seismic data (abstract) (Fig. 2). Brancato discloses the seismic data comprising first data acquired at a first seismic receiver (station) and second seismic data acquired at a second seismic receiver spatially separated from the first receiver (Fig. 2) (Page 223, 224). Brancato discloses means for determining an overall measure of similarity for a pair of passive seismic events in the seismic traces (determinations made for the set of stations are disclosed as being used), the overall measure of similarity being indicative of the similarity between the events acquired at the first seismic receiver, and of similarity between the events acquired at the second receiver (abstract; 222-224; 229-230, 232).

With regard to claim 17, Brancato discloses the apparatus is adapted to process the seismic data in real time (221).

With regard to claim 18, Brancato discloses that the apparatus is adapted to determine as the overall measure of similarity an overall correlation coefficient indicative of correlation between events acquired at the first receiver and correlation between events from the second receiver (abstract; 222-224; 229-230, 232).

With regard to claim 19, Brancato discloses that the means for determining the overall correlation coefficient comprises means for determining a first correlation coefficient from the pair of events from the first data, means for determining a second

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correlation coefficient for the pair of events from the second data, and means for determining the overall correlation coefficient for the pair of events from the first correlation coefficient and the second correlation coefficient (223-224, 229-230, 232).

With regard to claim 20, Brancato discloses means for comparing the overall measure of similarity with a first predetermined threshold (223-224, 229-230, 232).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brancato (ELSEVIER April 18, 2003).

With regard to claims 21-24, Brancato does not specifically disclose that the method is carried out by a programmable data processor, with the program on a storage medium. It is known in the art of seismic data processing that computers are used to analyze acquired data and perform method steps involved in the processing of the data due to the large volumes of data involved and the complexity of the calculations and processing steps (See Page 238 or Brancato, citing to Lahr, J.C. whose title shows that computers are used in this type of processing).

Claims 9 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brancato (ELSEVIER April 18, 2003) as applied to claims 1-8, 10-11, and 15-24 above, and further in view of Badawy (Journal of Geodynamics, 2002).

With regard to claims 9 and 12-14, Brancato does not disclose that averages or weighted averages of the coefficients are use. Badawy teaches a method of determining the similarity of events acquired at a receiver for identifying microseismic events (abstract). Badawy teaches that it is known to use averaging of correlation values to determine correlation coefficients, and that averaging of values obtained from multiple stations is also used (abstract; 225-226). It would have been obvious to modify Brancato to include multiple events from each receiver and to determine information about the overall fault.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SCOTT A. HUGHES whose telephone number is (571)272-6983. The examiner can normally be reached on M-F 9:00am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. A. H./
Examiner, Art Unit 3663

/Jack W. Keith/
Supervisory Patent Examiner, Art Unit 3663